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ABSTRACT

In 1981, the reading achievement of a representative sample of Queensland (Australia) Year 5 students was assessed by using a test that measured skills in the areas of vocabulary, comprehension, and speed of reading. The aim of this testing was to compare reading achievement in 1981 with reading achievement in 1971 and 1976. Comparisons of achievement were made for three periods: 1971-1976, 1976-1981, and 1971-1981. Analysis of the results showed that there was a statistically significant decrease in the means of vocabulary, implied comprehension, and speed of reading between 1971 and 1976. There was no statistically significant change between 1976 and 1981. The means for vocabulary and speed of reading were statistically lower in 1981 than they were in 1971. The data did not indicate if the measured decrease in test means was due to lower reading achievement or one or more factors such as curriculum changes; high test scores in 1971; changes in the basic characteristics of the school populations tested; or cultural, value, and attitudinal changes in Australians. However, the absence of any significant differences between 1976 and 1981 test means indicates that it may be reasonable to assume the changes evident between 1971 and 1976 were not the beginning of a continuing downward trend in reading achievement. (HOD)

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# A COMPARISON OF THE READING ACHIEVEMENT OF QUEENSLAND YEAR 5 PUPILS BETWEEN 1971, 1976 AND 1981

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## ABSTRACT

In 1981, the reading achievement of a representative sample of Queensland Year 5 pupils was assessed. The aim of this testing was to compare reading achievement in 1981 with reading achievement in 1971 and 1976. Analysis of the results showed no change in reading achievement between 1976 and 1981. The 1981 means for vocabulary and speed of reading were less than the 1971 means.

## INTRODUCTION

At regular intervals, standardised tests of educational achievement are administered to pupils in Queensland primary schools. The main purpose of this testing has been to determine whether changes have occurred in standards of achievement in certain basic skills.

The reading ability of Year 5 pupils in Queensland schools has been surveyed since 1946 at five year intervals. Reading skills such as vocabulary, comprehension and speed of reading have been examined in these surveys using various reading tests. For the first time in 1971, and subsequently in 1976 and 1981, the test QR5 designed to measure achievement in these three components of reading, was administered to representative samples of Year 5 pupils in Queensland State primary schools. In 1977, some additional data were collected to supplement the 1976 survey. This report examines the differences between the 1971, 1976 and 1981 scores on the measures provided by the test QR5. The 1977 supplementary data are not considered.

In previous surveys, only the two most recent sets of data were compared. Because of the decline from 1971 to 1976 in the mean QR5 scores, the analysis reported here includes comparisons between 1971 and 1981 as well as the comparisons between 1976 and 1981.

The ACER Reading for Meaning and Speed of Reading tests were last administered in 1971. The mean scores on these tests were higher in 1971 than in any previous year. The test QR5 was administered for the first time in 1971. The mean scores on QR5 were higher in 1971 than they have been in any subsequent year of testing. There is no statistical evidence to indicate the extent to which the mean scores on the tests used in 1971 can be meaningfully compared.

It is possible for the attributes measured by particular test items to change over substantial periods of time. In order to monitor changes of this nature in future years, some item statistics for the test QR5 have been included. Correlations between the items of QR5 and the full test and basic test total scores are reported in Table 10, and item facility statistics are reported in Table 13.

In attempting both to assess reading skills of individual pupils and to compare achievement levels of these skills for groups of pupils from different time periods, it is important to acknowledge the differences between the contexts in which the pupils are acquiring their reading behaviours. In any particular time period the prevailing personal, family, educational and societal experiences and background will significantly affect pupils' reading ability and, in particular, affect their performance on tests designed to measure some of the elements of reading achievement. Comparisons using the same test instruments in these differing contexts can only provide somewhat tenuous and unsatisfactory information on changes in pupils' reading performance if no account is taken of the changes in the characteristics of the contexts. There are so many salient characteristics of pupils' environment – ranging from those of a purposive educational nature, planned to have a direct effect on reading performance, to those which may

affect reading performance less directly, such as a number of diverse but nevertheless pervasive societal influences – that to isolate their individual contribution to changes in reading performance would be far beyond the scope of this study.

The major differences in the characteristics of the educational milieus in 1971 and 1976 have been described previously by Duck (1979). A brief outline of these characteristics, together with an outline of some of the major societal characteristics covering the time period spanned by the 1971, 1976 and 1981 surveys of reading achievement of Queensland Year 5 pupils follows.

Societal developments between 1971 and 1981 which may affect the quality of pupils' home and school learning environments include such factors as:

- structural changes in the family;
- increasing proportions of one parent families;
- increasing numbers of ex-nuptial births;
- smaller size families;
- greater proportions of families with both parents working;
- greater unemployment;
- decrease in proportions of dwellings which are owner-occupied;
- increasing proportions of homes with televisions and telephones;
- continuing and increasing influence of technology on communications and other aspects of life; and
- influence of the style, language and spelling of advertising.

Major educational developments and factors pertaining to the primary school environment that should be noted when comparing the 1971, 1976 and 1981 contexts include:

- the continuation and full implementation of the language arts curriculum with its emphasis on the listening, speaking, reading and writing areas of communications;
- the ever present processes involving the introduction of new curricular areas or the development of curricula – such as music and physical education – bringing their different thrusts as well as increased competition for pupils' and teachers' time and energies;
- the introduction of programs and infusion of funds, through initiatives such as the Priority Country Area Program and Special Program Schools Scheme, designed to enrich the educational experiences of pupils in isolated and disadvantaged schools;
- the continuing increase in the numbers of children whose educational background includes pre-school experiences;
- the continuation and further development of the advisory and change agent roles of the primary inspectorate;
- the encouragement of greater autonomy of schools and more locally based decision making as the provision of educational support becomes less centralised through regionalisation and school based co-operative evaluation;
- the initial expansion of the advisory teacher service (from 14 in 1971 to a peak of 99 in 1977) has been followed by a period of contraction from 1979 to 1981 (37 primary advisory teachers in 1981);
- the continued and steady growth in the numbers of remedial/resource teachers placed in regular schools to help children with special learning difficulties (from 20 in 1971, to 171 in 1976 and 290 in 1981);
- the maintenance through the period 1976 to 1981 of the levels of teacher-librarians within State schools;
- the continued but gradual increase in the number of full-time equivalent teacher aides first attached to primary schools in 1973;
- the continuation of the number and an expansion of the range of in-service opportunities available to teachers with, in particular, the emphasis on school based in-service activities involving whole school staffs;
- the steady growth in the proportion of teachers with four or more years teacher training (from 1.08 per cent in 1971, to 9.81 per cent in 1976 and 12.22 per cent in 1981);
- the maintenance in 1981 (28.4) of the lower average class size in primary schools in 1976 (28.3) in comparison with that of 1971 (31.9);
- the slow but gradual increase in the proportion of teaching spaces which are flexible teaching areas; and
- the continual decrease in the numbers of small schools (i.e. with enrolments less than 35) and an increase in the proportion of large schools (i.e. with enrolments greater than 600).

These educational and societal factors, together with other factors have the capacity individually, and in combination, to exercise some influence on pupils' educational experiences in general and pupils' measured reading performance in particular. Some of the trends may contribute to enhance reading skills, others may affect reading deleteriously.

Further, over and above these factors, basic structural systemic differences in the nature of the 1971, 1976 and 1981 populations of Year 5 pupils in State schools can also, of themselves, contribute to differences in the mean scores of the reading measures obtained from the samples tested in these years. Some of these basic differences include:

- the average age of Year 5 pupils in State schools has decreased (as of August 1 of each year, the average ages were 10 years and 3 months in 1971 and 1976, but 10 years and 2 months in 1981);
- the proportion of pupils who are female has risen (from 0.48 in 1971 and 1976 to 0.49 in 1981);
- the percentage of Year 5 pupils attending State in comparison to non-State schools has increased (1971: 79.6 per cent; 1976:78.9 per cent; and 1981: 81.5 per cent);
- the trend of Queensland having a positive net internal migration contributes to the greater proportion of Queensland Year 5 pupils in 1981 having different educational preparation and experiences; and
- the gradual implementation of the policy of placing children in their least restrictive educational environment will result in larger proportions of children with moderate to mild intellectual handicapping conditions being catered for in the regular school system, rather than in segregated special settings.

The problems associated with analysing the effect of any of these factors separately are enormous and beyond the scope of this study. The differences which are reported here reflect the combined effects of these factors and any other factors which may be affecting the achievement of Year 5 pupils in State schools in Queensland.

## COMPARISON OF READING ABILITY IN 1971, 1976 AND 1981

### SAMPLING PROCEDURES

The sampling procedure adopted for the 1981 survey was based on the requirement that each Year 5 pupil in the State have an equal chance of being selected in the sample.

A three stage cluster sample was used to select pupils for testing. The first stage involved the selection of 80 clusters of pupils, each containing at least 30 pupils. The second stage involved the selection of classes of pupils from each cluster to be tested. The third stage involved the selection of 25 pupils from each of these classes to be included in the analysis.

The clusters were selected with reference to a list of State primary schools and their Year 5 enrolments organised in alphabetical order within the nine education regions of the State.

Each school with at least 30 Year 5 pupils was considered as a separate cluster. Schools with fewer than 30 pupils were combined with subsequent such schools from the list until a cluster of at least 30 Year 5 pupils was obtained. Thus, each cluster contained at least 30 Year 5 pupils. The 80 clusters to be included in the sample were selected by allocating to each cluster in the State list, a number of 'tickets' corresponding to its Year 5 enrolment. An equal interval random start method was then used to select tickets. Thus, the probability of a particular cluster being selected was proportional to its effective Year 5 enrolment.

The schools involved in the survey provided information concerning the distribution of pupils within classes. From this information, units of at least 30 pupils were selected and schools were advised which pupils were to be tested. When the test results were received from schools, pupils were randomly excluded until 25 remained in each cluster.

The above sampling procedures resulted in a sample of 2002 pupils from 80 clusters within 135 schools being included in the survey. A list of the schools involved is contained in Appendix B.

In previous studies of Year 5 reading achievement (Duck, 1979), the size and geographical location of schools was used to stratify the population prior to sampling. This was discontinued in 1981 for two main reasons. Firstly, the effect of class of school was shown to be not significant for the 1976 data. Secondly, the method of classifying schools by geographic location using metropolitan, provincial city and country as categories is somewhat arbitrary and produces some anomalous classifications. Hence, in 1981, the more general approach of cluster sampling directly from the population without prior stratification based on size and geographical location was used. However, test statistics for 1981 based on class of school were collected and are included in Appendix B (Table 11) for completeness.

### TEST ADMINISTRATION

Several weeks before testing was to be undertaken, the principals of the schools selected to participate were notified by letter that testing would be carried out. The letter stressed that individual schools would not be identified and that no comparisons would be made between specific schools. Schools were asked to continue with the normal school programs, so that no attempt would be made to inflate the test scores. The selected schools were subsequently forwarded copies of the test instruments, answer sheets and directions for administering the tests. On 10 November 1981 testing was conducted. Pupils' answer sheets were returned to the Research Branch for marking.

### TESTS USED

From 1946 to 1971, the reading achievement of Year 5 pupils was assessed by means of the ACER Reading for Meaning and Speed of Reading tests, which were initially developed in 1933. However, in 1971 the tests were withdrawn from general sale by ACER.

A new test, QR5, developed from *Test R: Reading* from the New South Wales Basic Skills Battery was prepared to assess reading performance of Year 5 pupils in Queensland. In 1971, both the ACER Reading for Meaning and Speed of Reading tests and the QR5 test were administered. Results on the ACER tests were used to compare

reading achievement in 1971 with reading achievement in previous years. The performance of Year 5 pupils on QR5 in 1971 was to be used for comparisons of reading achievement in subsequent years. It has been administered in 1971, 1976 and 1981 as part of the Year 5 periodic survey and in 1977 to supplement the data from the 1976 study. Minor modifications were made to QR5 prior to its use in 1981 involving changes of imperial units of measurement.

The Reading Test QR5 provides three scores: reading comprehension, reading vocabulary and speed of reading. The test consists of a number of graded passages of different styles covering a variety of topics. Each passage is followed by between nine and 13 vocabulary and comprehension questions. In all, there are nine passages and 100 questions in the test, and time allowed for completion is 40 minutes.

Overall, there are 45 vocabulary items and 55 comprehension items distributed throughout the tests. The comprehension items have been further divided according to whether they appear to test literal meaning or implied meaning. Twenty-nine items have been classified as testing literal meaning and 26 items have been classified as testing implied meaning. A full description of literal and implied meaning may be found in Research and Curriculum Branch Bulletin No. 41 (Department of Education, 1972).

The first 45 items of QR5 form the basic test. In the time allowed, most Year 5 pupils are able to complete the basic test. Hence, the performance of pupils on these 45 items provides measures of achievement which are largely independent of the pupils' rate of response.

The total score on the full test provides a score of reading speed since most Year 5 pupils are unable to finish the full test in 40 minutes. Since the test total is the number of correctly answered vocabulary and comprehension items, it should be interpreted as the pupil's speed of reading with comprehension, and not as a pure measure of speed of reading.

The full test and the basic test have approximately the same proportion of each type of item. Of the 45 items in the basic test, there are 20 vocabulary items and 25 comprehension items. Of the latter, 13 are literal comprehension items, and 12 are implied comprehension items.

The distribution of items in Reading Test QR5 on both the basic 45 item test and the full 100 item test is shown in Table 1.

**Table 1: Distribution of items on Reading Test QR5 basic test and full test**

| BASIC TEST | | | | FULL TEST (SPEED OF READING) | | | |
|---|---|---|---|---|---|---|---|
| Number of Items | Number of Vocabulary Items | Number of Comprehension Items | | Number of Items | Number of Vocabulary Items | Number of Comprehension Items | |
| | | Literal | Implied | | | Literal | Implied |
| 45 | 20(44%) | 13(29%) | 12(27%) | 100 | 45(45%) | 29(29%) | 26(26%) |

## ANALYSIS UNDERTAKEN

Analysis of variance procedures was used to determine if changes of Queensland Year 5 pupils' scores on the QR5 test had occurred between 1971, 1976 and 1981. Since the sample was a cluster sample, it is not appropriate to analyse the data under the assumption of simple random sampling. The analysis design used was the cluster sample model which is described in Appendix A. This model accounts for the main effect of the year of testing and the effect of pupils being grouped in clusters within years. For each score and subscore provided by QR5, an F statistic was calculated to indicate whether the variation between the year means was likely to be a consequence of the particular samples chosen. The statistical significance of differences between means, for individual pairs of years, was investigated using the Newman-Keuls Test.

## RESULTS

The results of the analysis are discussed for the Speed of Reading test (all items) and the basic test (first 45 items only). The scores for vocabulary, comprehension, literal and implied subtests of the Speed of Reading test are reported. Scores on the corresponding subscales of the basic test are not reported.

## SPEED OF READING

The analysis of variance indicated that the differences observed between the 1971, 1976 and 1981 total comprehension means were statistically significant at the .01 level ($F = 479$, $df = 2, 5313$). When these changes in mean achievement were investigated and tested using the Newman-Keuls Test based on the Studentised Range Statistic, it was found that the only statistically significant difference occurred between 1971 and 1976. The total comprehension results and the results of the literal and implied meaning components are shown in Table 2. It should be noted that these comprehension measures also involve a speed component.

From Table 2, it can be seen that the total comprehension mean decreased by 1.03 between 1971 and 1976. The analysis of variance showed that there was a statistically significant variation in implied comprehension ($F = 7.40$, $df = 2, 5313$) but no significant variation in literal comprehension ($F = 2.23$, $df = 2, 5313$) between the 1971, 1976 and 1981 scores. The values of the Studentised Range Statistic indicated that the only significant change in implied comprehension was between 1971 and 1976. From Table 2, it can be seen that the implied comprehension mean decreased by 0.66 in this period. The values of the sample statistics are reported in Tables 7 and 12.

**Table 2: Mean scores, standard deviations and differences between year means for the comprehension components of Reading Test QR5**

| | | | LITERAL COMPREHENSION (29) | | |
|---|---|---|---|---|---|
| | | | Mean Differences | | |
| Year | Mean | S.D. | 1971 | 1981 | 1976 |
| 1971 | 14.35 | 5.59 | – | 0.17 | 0.37 |
| 1981 | 14.18 | 5.24 | – | – | 0.20 |
| 1976 | 13.98 | 5.44 | – | – | – |

| | | | IMPLIED COMPREHENSION (26) | | |
|---|---|---|---|---|---|
| | | | Mean Differences | | |
| Year | Mean | S.D. | 1971 | 1981 | 1976 |
| 1971 | 11.90 | 5.38 | – | 0.25 | 0.66* |
| 1981 | 11.65 | 5.29 | – | – | 0.41 |
| 1976 | 11.24 | 5.24 | – | – | – |

| | | | TOTAL COMPREHENSION (55) | | |
|---|---|---|---|---|---|
| | | | Mean Differences | | |
| Year | Mean | S.D. | 1971 | 1981 | 1976 |
| 1971 | 26.25 | 10.56 | – | 0.42 | 1.03* |
| 1981 | 25.83 | 10.11 | – | – | 0.61 |
| 1976 | 25.22 | 10.24 | – | – | – |

Numbers in brackets ( ) indicate the number of items in each component of the test.

An asterisk * indicates that the difference is significant at the 0.01 level (using the Newman-Keuls Test).

The results for reading vocabulary are shown in Table 3. Again, these results are based on a test with a speed component.

**Table 3: Mean scores, standard deviations and differences between year means for the reading vocabulary component of Reading Test QR5**

| | | | READING VOCABULARY (45) | | |
|---|---|---|---|---|---|
| | | | Mean Differences | | |
| Year | Mean | S.D. | 1971 | 1981 | 1976 |
| 1971 | 17.89 | 9.03 | – | 1.18* | 1.61* |
| 1981 | 16.71 | 8.17 | – | – | 0.43 |
| 1976 | 16.28 | 8.22 | – | – | – |

Number in brackets ( ) indicates the number of items in the test scale.

An asterisk * indicates that the difference is significant at the 0.01 level (using the Newman-Keuls Test).

A similar analysis of variance showed that the differences between the vocabulary means for 1971, 1976 and 1981 were statistically significant ($F = 18.49$, $df = 2, 5313$). When the differences were tested individually using the Newman-Keuls Test, it was found that the statistically significant differences were between the means for 1971 and 1976 and between the means for 1971 and 1981. From Table 3, it can be seen that the vocabulary mean decreased by 1.61 between 1971 and 1976. The mean in 1981 was 1.18 less than the mean in 1971.

The results for the full test are presented in Table 4. These means are an indicator of the pupils' speed of reading since most of the pupils do not complete the test. Because speed of reading on QR5 is defined as the total number of items answered correctly in the entire 100 item test, the result is not merely a measure of the rate at which a person progresses through the test, but also a measure of the level of understanding the person has about the material read. Hence, any change in levels of vocabulary or comprehension achievement should also affect the speed of reading score.

**Table 4: Mean scores, standard deviations and differences between year means for the full Reading Test QR5**

| | | | FULL TEST (100) | | |
|---|---|---|---|---|---|
| | | | Mean Differences | | |
| Year | Mean | S.D. | 1971 | 1981 | 1976 |
| 1971 | 44.14 | 19.10 | – | 1.60* | 2.64* |
| 1981 | 42.54 | 17.76 | – | – | 1.04 |
| 1976 | 41.50 | 17.94 | – | – | – |

Number in brackets ( ) indicates the number of items in the test.

An asterisk * indicates that the difference is significant at the 0.01 level (using the Newman-Keuls Test).

Analysis of variance indicated that the differences between the total test means for 1971, 1976 and 1981 were statistically significant (F = 10.12, df = 2, 5313). The values of the Studentised Range Statistic showed that the statistically significant changes in the total test score occurred between 1971 and 1976 and between 1971 and 1981. From Table 4, it can be seen that the total test mean decreased by 2.64 between 1971 and 1976. The mean in 1981 was 1.6 less than the mean in 1971.

### BASIC TEST

It should be noted that all results reported so far are based on the speeded test in which rate of responding is important. The results on the 45 item basic tes which contains 25 comprehension items and 20 vocabulary items are shown in Table 5.

**Table 5: Mean scores, standard deviations and differences between year means for the basic test component of Reading Test QR5**

| | | | BASIC TEST (45) | | |
|---|---|---|---|---|---|
| | | | Mean Differences | | |
| Year | Mean | S.D. | 1971 | 1981 | 1976 |
| 1971 | 27.76 | 8.52 | – | 0.12 | 0.67 |
| 1981 | 27.64 | 8.39 | – | – | 0.55 |
| 1976 | 27.09 | 8.45 | – | – | – |

Number in brackets ( ) indicates the number of items in the test scale.

The analysis of variance test indicated that the differences between the means shown in Table 5 were not statistically significant (F = 3.41, df = 2, 5313).

In 1981, separate analysis of differences based on class of school were not undertaken. However, for completeness, the mean scores for each class of school have been included in Table 11. Table 9 gives some further item data which has not been reported in previous years, concerning the subtest scales to which each item contributed.

## DISCUSSION

The test QR5 provides measures of reading achievement in the specific areas of vocabulary, literal comprehension, implied comprehension, total comprehension, speed of reading, and non-speeded reading. Using each of these measures, mean scores have been calculated for 1971, 1976 and 1981. Comparisons of achievement have been made for the three periods 1971–1976, 1976–1981 and 1971–1981. Tables 2, 3, 4 and 5 show that all the sample means decreased between 1971 and 1976, and between 1971 and 1981, but that between 1976 and 1981 all the means increased.

In all cases, the 1971 sample mean is greater than the 1981 mean. The statistics calculated showed that the differences for non-speeded reading, and literal, implied and total comprehension were small enough to have been a result of the particular samples chosen. However, the mean scores for vocabulary and speed of reading were shown to be statistically significantly less in 1981 than they were in 1971. Similarly, differences in vocabulary, implied and total comprehension and speed of reading between 1971 and 1976 were statistically significant in favour of the 1971 measures at the 0.01 level. Although the mean scores in 1981 in speeded and non-speeded reading, vocabulary, and literal, implied and total comprehension were greater than those of 1976, none of these differences were shown to be statistically significant.

The educational significance of the changes cannot be inferred from the statistics alone. The statistics serve only to indicate which changes in test scores cannot be attributed to chance fluctuations due to sampling, and which may be attributed to changes in the populations. The educational significance of the changes can only be assessed by considering their magnitudes, together with an assessment of the nature of the tests used.

The available data cannot indicate if the measured decrease in test means is due to lower reading achievement or one or more possible factors such as curriculum changes; spuriously high test scores in 1971; changes in the basic characteristics of the school populations tested; or cultural, value and attitudinal changes in Australians. However, the absence of any significant differences between 1976 and 1981 test means indicates that it may be reasonable to assume that the changes evident between 1971 and 1976 are not the beginning of a continuing downward trend in reading achievement.

## SUMMARY

The major purpose of this survey was to compare reading achievement of Year 5 pupils in Queensland primary schools in 1981 with reading achievement of Year 5 pupils in 1971 and 1976.

Reading Test QR5 was administered to a sample of 2002 Year 5 pupils in 135 primary schools in November 1981.

Analysis of the results showed that there was a statistically significant decrease in the means of vocabulary, implied comprehension and speed of reading between 1971 and 1976. There was no statistically significant change between 1976 and 1981. The means for vocabulary and speed of reading were statistically lower in 1981 than they were in 1971. A summary of the differences, and their statistical significance, for the reading test and subtest scores is presented below in Table 6 for all the comparisons between 1971, 1976 and 1981.

**Table 6: Summary of statistical differences (significance level = 0.01) of reading test scores — 1971, 1976 and 1981**

| | TESTS | | | | | |
|---|---|---|---|---|---|---|
| Comparisons | Non-Speeded Reading (Basic Test) | Speeded Reading (Full Test) | Vocabulary | Comprehension Total | Implied Comprehension | Literal Comprehension |
| Between 1971 and 1976 | No Difference | Decrease | Decrease | Decrease | Decrease | No Difference |
| Between 1971 and 1981 | No Difference | Decrease | Decrease | No Difference | No Difference | No Difference |
| Between 1976 and 1981 | No Difference | No Difference | No Difference | No Difference | No Difference | No Difference |

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## APPENDIX A: ANALYSIS OF VARIANCE MODEL

For comparing scores between 1971, 1976 and 1981, the model assumed was:

$Y_{ijk} = \mu + \alpha_k + \gamma_{j/k} + \varepsilon_{ijk}$

$Y_{ijk}$ – score of individual i in school j in year of testing k

$\mu$ – grand mean, common to all individuals

$\alpha_k$ – main effect of year of testing k

$\gamma_{j/k}$ – effect due to school j within year of testing k

$\varepsilon_{ijk}$ – residual component, reflecting individual differences and error of measurement

The appropriate error term for year main effects is the within cells sum of squares.

**Table 7: Analysis of variance data for comparison of the year means of the measures provided by Reading Test QR5**

| Measure | S.S. | | d.f. | | M.S. | | F |
|---|---|---|---|---|---|---|---|
| | Between Years | Within Schools | Between Years | Within Schools | Between Years | Within Schools | |
| Vocabulary | 2454.55 | 352601 | 2 | 5313 | 1227.27 | 66.37 | 18.49* |
| Literal Comprehension | 122.74 | 146408 | 2 | 5313 | 61.37 | 27.56 | 2.23 |
| Implied Comprehension | 387.74 | 139250 | 2 | 5313 | 193.87 | 26.21 | 7.40* |
| Total Comprehension | 944.34 | 524267 | 2 | 5313 | 472.17 | 98.68 | 4.79* |
| Total Test | 6233.93 | 1636878 | 2 | 5313 | 3116.90 | 308.09 | 10.12* |
| Basic Test | 452.06 | 352285 | 2 | 5313 | 266.03 | 66.31 | 3.41 |

An asterisk * indicates that the F ratio is significant at the 0.01 level.

## APPENDIX B: ADDITIONAL TABLES

**Table 8: Schools selected to participate in the 1981 survey**

| REGION | SCHOOLS |
|---|---|
| Brisbane-North | Albany Creek, Aspley, Bray Park, Burnside, Chermside, Cnevallum, Deception Bay North, Derny Grove, Grovely, Kallangur, Maroochydore, Morayfield, Northgate, Nudgee Beach, Palmwoods, Samford, Stafford Heights, The Gap, Yandina |
| Brisbane-West | Boonah, Camira, Dinmore, Graceville, Ipswich North, Jindalee, Leichhardt, Patrick Estate, Peak Crossing, Prenzlau, Pullenvale, Riverview, Serviceton, Tivoli |
| Brisbane-South | Ashmore, Benowa, Broadbeach, Canungra, Coombabah, Eagleby South, Holland Park, Labrador, Macgregor, Mayfield, Mount Gravatt, Natural Bridge, Numinbah Valley, Ormeau, Pimpama, Rathdowney, Rochedale, Southport, Tamrookum, Veresdale Scrub, Waterford, Waterford West, Wondall Heights, Wynnum North |
| Darling Downs | Clintonvale, Cooyar, Cottonvale, Dalveen, Daymar, Dirranbandi, Harlaxton, Oakey, Talwood, Tanduringie, Tannymorel, Texas, Warwick West |
| South-Western | Dalby, Roma |
| Wide Bay | Bundaberg East, Burnett Heads, Cooran, Cordalba, Coringa, Crawford, Dagun, Dallarnil, Degilbo, Gympie West, Maryborough West, Pialba, Theebine, Tiaro, Tin Can Bay, Tingoora, Woolooga, Woongarra, Wooroolin, Yandaran |
| Central | Alligator Creek, Biloela, Cawarral, Chelona, Clarke Creek, Clermont, Emerald North, Gladstone Central, Gracemere, Marian, Marlborough, Marmor, Moura, Theodore |
| Northern | Aitkenvale, Balaclava, Cairns North, Currajong, Georgetown, Giru, Greenvale, Hermit Park, Kirwan, Moresby, Mount Garnet, Proserpine, Toobanna, Townsville South, Trebonne, Weir |
| North-Western | Bedourie, Birdsville, Boulia, Burketown, Cameron Downs, Camooweal, Corfield, Dajarra, Maxwelton, McKinlay, Mornington Island, Muttaburra, Normanton |

**Table 9: Reading Test QR5 answers and item description**

| Item | Answer | Measure | Item | Answer | Measure |
|---|---|---|---|---|---|
| 1 | D | L | 51 | A | I |
| 2 | A | L | 52 | A | V |
| 3 | A | L | 53 | C | V |
| 4 | C | L | 54 | A | V |
| 5 | B | I | 55 | D | V |
| 6 | B | I | 56 | C | V |
| 7 | D | I | 57 | B | V |
| 8 | B | V | 58 | B | L |
| 9 | A | V | 59 | A | L |
| 10 | D | V | 60 | D | I |
| 11 | B | V | 61 | C | I |
| 12 | D | L | 62 | A | L |
| 13 | A | I | 63 | C | I |
| 14 | C | I | 64 | D | I |
| 15 | C | I | 65 | C | V |
| 16 | B | I | 66 | A | V |
| 17 | C | V | 67 | B | V |
| 18 | B | V | 68 | D | V |
| 19 | D | V | 69 | C | V |
| 20 | D | V | 70 | D | V |
| 21 | B | V | 71 | D | I |
| 22 | D | I | 72 | A | I |
| 23 | C | L | 73 | C | I |
| 24 | B | L | 74 | D | I |
| 25 | D | L | 75 | A | I |
| 26 | B | L | 76 | A | V |
| 27 | C | V | 77 | C | V |
| 28 | B | V | 78 | B | V |
| 29 | C | V | 79 | B | V |
| 30 | B | V | 80 | C | L |
| 31 | D | V | 81 | C | I |
| 32 | B | L | 82 | A | L |
| 33 | A | L | 83 | C | L |
| 34 | D | I | 84 | B | L |
| 35 | B | I | 85 | A | V |
| 36 | C | I | 86 | B | V |
| 37 | D | L | 87 | C | V |
| 38 | A | I | 88 | A | V |
| 39 | C | V | 89 | B | L |
| 40 | A | V | 90 | B | L |
| 41 | C | V | 91 | C | I |
| 42 | A | V | 92 | C | L |
| 43 | D | V | 93 | B | I |
| 44 | C | V | 94 | C | L |
| 45 | C | L | 95 | B | L |
| 46 | C | L | 96 | B | V |
| 47 | D | L | 97 | C | V |
| 48 | B | L | 98 | C | V |
| 49 | C | I | 99 | D | V |
| 50 | D | L | 100 | A | V |

L = *Literal Comprehension Item* I = *Implied Comprehension Item* V = *Vocabulary Item*

**Table 10: Proportion of the sample attempting each item of Reading Test QR5, item-full test correlations and item-basic test correlations based on the 1981 data**

| Item | Attempting* % | Basic Test Point Biserial | Full Test Point Biserial | Item | Attempting* % | Basic Test Point Biserial | Full Test Point Biserial | Item | Attempting* % | Basic Test Point Biserial | Full Test Point Biserial |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 99.8 | .37 | .27 | 35 | 94.9 | .48 | .40 | 69 | 47.1 | | .36 |
| 2 | 99.5 | .38 | .30 | 36 | 93.8 | .55 | .46 | 70 | 51.0 | | .49 |
| 3 | 96.7 | .47 | .39 | 37 | 92.8 | .47 | .43 | 71 | 47.5 | | .67 |
| 4 | 96.2 | .44 | .35 | 38 | 91.8 | .53 | .47 | 72 | 45.0 | | .49 |
| 5 | 94.6 | .42 | .36 | 39 | 93.1 | .47 | .43 | 73 | 43.1 | | .57 |
| 6 | 88.5 | .36 | .28 | 40 | 91.7 | .36 | .32 | 74 | 40.7 | | .40 |
| 7 | 94.8 | .35 | .31 | 41 | 92.4 | .57 | .50 | 75 | 41.7 | | .43 |
| 8 | 97.3 | .37 | .33 | 42 | 90.1 | .10 | .10 | 76 | 39.3 | | .57 |
| 9 | 98.2 | .50 | .47 | 43 | 90.8 | .53 | .50 | 77 | 39.3 | | .46 |
| 10 | 98.1 | .27 | .25 | 44 | 91.9 | .51 | .47 | 78 | 38.7 | | .41 |
| 11 | 98.1 | .36 | .32 | 45 | 88.4 | .43 | .39 | 79 | 37.0 | | .59 |
| 12 | 99.4 | .41 | .29 | 46 | 87.3 | | .56 | 80 | 31.8 | | .44 |
| 13 | 98.0 | .52 | .41 | 47 | 85.0 | | .49 | 81 | 29.6 | | .51 |
| 14 | 95.9 | .33 | .28 | 48 | 84.6 | | .53 | 82 | 27.5 | | .51 |
| 15 | 95.2 | .36 | .32 | 49 | 82.2 | | .44 | 83 | 25.7 | | .38 |
| 16 | 98.9 | .43 | .41 | 50 | 79.1 | | .60 | 84 | 25.4 | | .42 |
| 17 | 97.6 | .45 | .42 | 51 | 79.0 | | .43 | 85 | 24.9 | | .46 |
| 18 | 96.6 | .37 | .32 | 52 | 80.3 | | .59 | 86 | 24.1 | | .44 |
| 19 | 98.1 | .22 | .15 | 53 | 79.3 | | .62 | 87 | 23.0 | | .47 |
| 20 | 98.4 | .37 | .30 | 54 | 78.2 | | .63 | 88 | 22.5 | | .38 |
| 21 | 98.8 | .45 | .39 | 55 | 77.0 | | .59 | 89 | 18.7 | | .48 |
| 22 | 98.8 | .40 | .32 | 56 | 74.1 | | .56 | 90 | 17.6 | | .45 |
| 23 | 98.4 | .39 | .29 | 57 | 73.3 | | .49 | 91 | 16.7 | | .39 |
| 24 | 97.9 | .46 | .37 | 58 | 68.8 | | .55 | 92 | 16.4 | | .38 |
| 25 | 96.8 | .52 | .41 | 59 | 67.4 | | .57 | 93 | 16.2 | | .42 |
| 26 | 96.7 | .46 | .38 | 60 | 63.4 | | .55 | 94 | 15.0 | | .34 |
| 27 | 97.5 | .47 | .42 | 61 | 60.6 | | .56 | 95 | 14.5 | | .20 |
| 28 | 97.9 | .35 | .25 | 62 | 60.7 | | .57 | 96 | 13.7 | | .37 |
| 29 | 95.8 | .38 | .35 | 63 | 59.0 | | .54 | 97 | 13.2 | | .38 |
| 30 | 95.4 | .36 | .28 | 64 | 57.6 | | .58 | 98 | 13.1 | | .40 |
| 31 | 95.2 | .33 | .26 | 65 | 56.4 | | .57 | 99 | 12.7 | | .23 |
| 32 | 95.9 | .55 | .42 | 66 | 53.3 | | .58 | 100 | 12.7 | | .38 |
| 33 | 96.8 | .54 | .42 | 67 | 53.7 | | .27 | | | | |
| 34 | 95.7 | .56 | .45 | 68 | 54.2 | | .58 | | | | |

**Table 11: Mean scores for each component of Reading Test QR5 by class of school – 1976 and 1981**

| Measure | Year | Class of School | | | | | | All Schools |
|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5* | 6 | |
| Literal Meaning | 1976 | 14.2 | 13.8 | 14.5 | 13.3 | 12.2 | 13.1 | 14.0 |
| | 1981 | 14.4 | 14.2 | 14.0 | 14.0 | 13.4 | – | 14.2 |
| Implied Meaning | 1976 | 11.5 | 11.1 | 11.7 | 10.2 | 9.2 | 9.2 | 11.2 |
| | 1981 | 12.0 | 11.7 | 11.5 | 11.2 | 10.1 | – | 11.6 |
| Total Comprehension | 1976 | 25.7 | 24.8 | 26.1 | 23.6 | 21.4 | 22.4 | 25.2 |
| | 1981 | 26.5 | 25.8 | 25.5 | 25.3 | 23.5 | – | 25.8 |
| Vocabulary | 1976 | 16.8 | 15.9 | 16.6 | 15.0 | 13.2 | 14.5 | 16.3 |
| | 1981 | 17.4 | 16.5 | 16.4 | 16.5 | 14.6 | – | 16.7 |
| Full Reading Test | 1976 | 42.5 | 40.7 | 42.7 | 38.6 | 34.6 | 36.9 | 41.5 |
| | 1981 | 43.9 | 42.4 | 41.9 | 41.8 | 38.1 | – | 42.5 |
| Basic Reading Test | 1976 | 27.5 | 26.6 | 28.1 | 25.8 | 23.8 | 25.0 | 27.1 |
| | 1981 | 28.4 | 27.8 | 27.2 | 26.5 | 25.3 | – | 27.6 |

* The 1981 figures for Class 5 schools include those schools which would have been classified as Class 6 schools in previous years.

**Table 12: Significant differences between pairs of year means using the Newman-Keuls Test with $\alpha = .01$**

| Measure | 1971–1976 | | 1976–1981 | | 1971–1981 | |
|---|---|---|---|---|---|---|
| | Observed | Critical | Observed | Critical | Observed | Critical |
| Vocabulary | 1.61 | 0.78 | 0.43 | 0.69 | 1.18 | 0.69 |
| Literal Comprehension | 0.37 | 0.50 | 0.20 | 0.44 | 0.17 | 0.44 |
| Implied Comprehension | 0.66 | 0.49 | 0.41 | 0.43 | 0.25 | 0.43 |
| Total Comprehension | 1.03 | 0.95 | 0.61 | 0.84 | 0.42 | 0.84 |
| Total Test (Speed of Reading) | 2.64 | 1.67 | 1.04 | 1.48 | 1.60 | 1.48 |
| Basic Test | 0.67 | 0.78 | 0.55 | 0.69 | 0.12 | 0.69 |

**Table 13: Item facilities* and the numbers of pupils with correct answers for each item of Reading Test QR5**

| Item | Facility | Number Correct | Item | Facility | Number Correct |
|---|---|---|---|---|---|
| 1 | .93 | 1857 | 51 | .45 | 733 |
| 2 | .93 | 1858 | 52 | .92 | 1487 |
| 3 | .75 | 1498 | 53 | .86 | 1379 |
| 4 | .70 | 1390 | 54 | .78 | 1241 |
| 5 | .79 | 1575 | 55 | .70 | 1096 |
| 6 | .62 | 1234 | 56 | .33 | 546 |
| 7 | .39 | 776 | 57 | .54 | 809 |
| 8 | .38 | 752 | 58 | .62 | 864 |
| 9 | .54 | 1070 | 59 | .59 | 801 |
| 10 | .35 | 690 | 60 | .65 | 863 |
| 11 | .47 | 934 | 61 | .58 | 741 |
| 12 | .89 | 1769 | 62 | .56 | 701 |
| 13 | .86 | 1718 | 63 | .56 | 677 |
| 14 | .59 | 1179 | 64 | .51 | 603 |
| 15 | .37 | 729 | 65 | .57 | 662 |
| 16 | .47 | 944 | 66 | .53 | 597 |
| 17 | .50 | 999 | 67 | .31 | 347 |
| 18 | .59 | 1180 | 68 | .71 | 777 |
| 19 | .40 | 795 | 69 | .25 | 265 |
| 20 | .78 | 1560 | 70 | .44 | 462 |
| 21 | .82 | 1631 | 71 | .70 | 680 |
| 22 | .84 | 1661 | 72 | .54 | 503 |
| 23 | .78 | 1551 | 73 | .59 | 531 |
| 24 | .75 | 1497 | 74 | .35 | 307 |
| 25 | .74 | 1475 | 75 | .37 | 317 |
| 26 | .61 | 1211 | 76 | .58 | 473 |
| 27 | .38 | 749 | 77 | .43 | 344 |
| 28 | .66 | 1313 | 78 | .30 | 235 |
| 29 | .42 | 833 | 79 | .75 | 561 |
| 30 | .60 | 1180 | 80 | .48 | 313 |
| 31 | .54 | 1066 | 81 | .52 | 314 |
| 32 | .83 | 1622 | 82 | .52 | 299 |
| 33 | .85 | 1658 | 83 | .37 | 200 |
| 34 | .80 | 1558 | 84 | .39 | 205 |
| 35 | .71 | 1371 | 85 | .66 | 331 |
| 36 | .74 | 1416 | 86 | .56 | 276 |
| 37 | .38 | 730 | 87 | .51 | 241 |
| 38 | .72 | 1376 | 88 | .30 | 139 |
| 39 | .28 | 540 | 89 | .70 | 269 |
| 40 | .49 | 934 | 90 | .53 | 195 |
| 41 | .76 | 1435 | 91 | .60 | 210 |
| 42 | .12 | 227 | 92 | .38 | 129 |
| 43 | .53 | 987 | 93 | .61 | 201 |
| 44 | .89 | 1655 | 94 | .36 | 114 |
| 45 | .64 | 1150 | 95 | .26 | 79 |
| 46 | .88 | 1559 | 96 | .44 | 126 |
| 47 | .73 | 1273 | 97 | .51 | 141 |
| 48 | .63 | 1084 | 98 | .69 | 186 |
| 49 | .60 | 1018 | 99 | .24 | 65 |
| 50 | .67 | 1116 | 100 | .55 | 141 |

* Facility is defined here as being the number of correct answers divided by the number of pupils reaching the item.